What is claimed is:

1. A high Al-containing Fe-Cr-Al based stainless steel sheet characterized by comprising, by weight, Cr: 10-30% and Al: >6.5%-15%, with the remainder consisting of Fe and unavoidable impurities.

2. A high Al-containing Fe-Cr-Al based stainless steel sheet according to claim 1, characterized in that said steel sheet further comprises, by weight, Si: 0.1-1.0% and Mn: ≤0.5%.

3. A high Al-containing Fe-Cr-Al based stainless steel sheet according to claim 1 or 2, characterized in that said steel sheet further comprises, by weight, either or both Ti: 0.02-0.1% and Nb: 0.02-0.3%, as well as La: 0.01-0.1%, Ce: 0.01-0.1% and P: 0.01-0.05%.

4. A high Al-containing Fe-Cr-Al based stainless steel sheet according to any one of claims 1 to 3, characterized in that said steel sheet further comprises, by weight, Cu: 0.01-1.0%.

5. A high Al-containing Fe-Cr-Al based stainless steel sheet according to any one of claims 1 to 4, characterized in that said steel sheet further comprises, by weight, Mg: 0.001-0.1%.

6. A high Al-containing Fe-Cr-Al based stainless steel sheet according to any one of claims 1 to 5, characterized in that the total of Zn, Sn, Sb, Bi and Pb in said steel sheet is limited to no greater than 0.05% by weight.

7. A high Al-containing Fe-Cr-Al based stainless steel sheet according to any one of claims 1 to 6, characterized in that the thickness of said steel sheet is 10-40 μm.

8. A high Al-containing double layered sheet characterized by comprising Al or an Al alloy adhering to the surface of a stainless steel sheet with a thickness of 5 μm to 2 mm, wherein the average composition is the composition of a high Al-containing Fe-Cr-Al based

stainless steel sheet according to any one of claims 1 to 6.

9. A high Al-containing double layered sheet according to claim 7, characterized in that said Al or Al alloy comprises at least one from among Si, Ca, Sr, Y, Zr, La, Ba, Mg, Ce, Hf and Ta.

10. A high Al-containing double layered sheet according to claim 8 or 9, characterized in that the sheet thickness is 10-40 μm.

11. A high Al-containing Fe-Cr-Al based stainless steel sheet according to claim 1, characterized in that the surface of said steel sheet has protrusions with a height of 1 μm or greater at a density of at least $100/cm^2$, and a sheet thickness of no greater than 100 μm, and is used in an exhaust gas purification catalyst-carrying honeycomb body.

12. A high Al-containing Fe-Cr-Al based stainless steel sheet according to claim 11, characterized in that said protrusions are made of metal, and the Al concentration in the protrusions is higher than the Al concentration in the steel sheet.

13. A high Al-containing Fe-Cr-Al based stainless steel sheet according to claim 11 or 12, characterized in that said steel sheet further comprises, by weight, Si: 0.1-1.0% and Mn: ≤0.5%.

14. A high Al-containing Fe-Cr-Al based stainless steel sheet according to claim 13, characterized by further comprising, by weight, either or both Ti: 0.02-0.1% and Nb: 0.02-0.3%, as well as La: 0.01-0.1%, Ce: 0.01-0.1% and P: 0.01-0.05%.

15. A high Al-containing Fe-Cr-Al based stainless steel sheet according to claim 1, characterized in that said steel sheet has isolated gaps in the interior and is used in an exhaust gas purification catalyst-carrying honeycomb body.

16. A high Al-containing Fe-Cr-Al based stainless

steel sheet according to claim 15, characterized in that said gaps are at positions within t/7 from the steel sheet surface in the sheet thickness direction of the steel sheet, where t is the thickness of said steel sheet.

17. A high Al-containing Fe-Cr-Al based stainless steel sheet according to claim 15 or 16, characterized in that the sizes of said gaps are between 0.1 and 5 μm.

18. A high Al-containing Fe-Cr-Al based stainless steel sheet according to any one of claims 15 to 17, characterized in that the thickness of said steel sheet is 10-40 μm.

19. A high Al-containing Fe-Cr-Al based stainless steel sheet according to any one of claims 15 to 18, characterized in that said steel sheet further comprises, by weight, Si: 0.1-1.0% and Mn: ≤0.5%.

20. A high Al-containing Fe-Cr-Al based stainless steel sheet according to claim 19, characterized in that said steel sheet further comprises, by weight, either or both Ti: 0.02-0.1% and Nb: 0.02-0.3%, as well as La: 0.01-0.1%, Ce: 0.01-0.1% and P: 0.01-0.05%.

21. A high Al-containing Fe-Cr-Al based stainless steel sheet according to claim 1, characterized in that the thickness t of said steel sheet is 10-40 μm, the thermal expansion coefficient α from 20°C to 1000°C is 15-23 μm/m/°C and the 0.2% proof strength σ (N/mm^2) measured at 900°C, the steel sheet thickness t (μm) and the thermal expansion coefficient α (μm/m/°C) are in a relationship satisfying the following inequality <1>, and the steel sheet is used in an exhaust gas purification catalyst-carrying honeycomb body.

$$\sigma \geq (-9.0875 \times \alpha^2 + 4.2913 \times 10^2 \times \alpha - 3.824215- \times 10^3)/t \quad <1>$$

22. A high Al-containing Fe-Cr-Al based stainless steel sheet according to claim 21, characterized in that said steel sheet further comprises, by weight, Si: 0.1-

1.0% and Mn: ≤0.5%.

23. A high Al-containing Fe-Cr-Al based stainless steel sheet according to claim 21 or 22, characterized in that said steel sheet further comprises, by weight, either or both Ti: 0.02-0.1% and Nb: 0.02-0.3%, as well as La: 0.01-0.1%, Ce: 0.01-0.1% and P: 0.01-0.05%.

24. A process for fabrication of a high Al-containing double layered sheet, characterized by adhering Al or an Al alloy to the surface of a stainless steel sheet with a thickness of 5 μm to 2 mm, wherein the average composition is a composition comprising Cr: 10-30% and Al: >6.5%-15%, with the balance consisting of Fe and unavoidable impurities.

25. A process for fabrication of a high Al-containing double layered sheet according to claim 24, characterized in that the average composition of said high Al double layered sheet further comprises, by weight, Si: 0.1-1.0% and Mn: ≤0.5%.

26. A process for fabrication of a high Al-containing double layered sheet according to claim 24 or 25, characterized in that the average composition of said high Al double layered sheet further comprises, by weight, either or both Ti: 0.02-0.1% and Nb: 0.02-0.3%, as well as La: 0.01-0.1%, Ce: 0.01-0.1% and P: 0.01-0.05%.

27. A process for fabrication of a high Al-containing double layered sheet according to any one of claims 24 to 26, characterized in that the average composition of said high Al double layered sheet further comprises, by weight, Cu: 0.01-1.0%.

28. A process for fabrication of a high Al-containing double layered sheet according to any one of claims 24 to 27, characterized in that the average composition of said high Al double layered sheet further comprises, by weight, Mg: 0.001-0.1%.

29. A process for fabrication of a high Al-

containing double layered sheet according to any one of claims 24 to 28, characterized in that the total of Zn, Sn, Sb, Bi and Pb in the average composition of said high Al double layered sheet is limited to no greater than 0.05% by weight.

30. A process for fabrication of a high Al-containing double layered sheet according to any one of claims 24 to 29, characterized in that said adhering Al or Al alloy comprises at least one from among Si, Ca, Sr, Y, Zr, Ba, La, Mg, Ce, Hf and Ta.

31. A process for fabrication of a high Al-containing Fe-Cr-Al based stainless steel sheet, characterized by subjecting a high Al-containing double layered sheet obtained by a process according to any one of claims 24 to 30 to foil rolling.

32. A process for fabrication of a high Al-containing Fe-Cr-Al based stainless steel sheet, characterized by subjecting a high Al-containing double layered sheet obtained by a process according to any one of claims 24 to 30 to diffusion heat treatment.

33. A process for fabrication of a high Al-containing Fe-Cr-Al based stainless steel sheet, characterized by subjecting a high Al-containing double layered sheet obtained by a process according to any one of claims 24 to 30 to diffusion heat treatment and then to foil rolling.

34. A process for fabrication of a high Al-containing Fe-Cr-Al based stainless steel sheet, characterized by subjecting said double layered sheet obtained by a process according to any one of claims 24 to 30 to foil rolling and then to diffusion heat treatment.

35. A process for fabrication of a high Al-containing Fe-Cr-Al based stainless steel sheet according to any one of claims 31 to 34, characterized in that the thickness of the steel sheet is no greater than 40 μm.

36. An exhaust gas purification catalyst-carrying

honeycomb body, characterized by being fabricated using a high Al-containing Fe-Cr-Al based stainless steel sheet according to any one of claims 1 to 7 or a high Al-containing double layered sheet according to any one of claims 8 to 10.

37. An exhaust gas purification catalyst-carrying honeycomb body, characterized by being fabricated using a high Al-containing Fe-Cr-Al based stainless steel sheet according to any one of claims 11 to 23.

38. An exhaust gas purification catalyst-carrying honeycomb body, characterized by being fabricated using a high Al-containing double layered sheet obtained by a process according to any one of claims 24 to 30, or a high Al-containing Fe-Cr-Al based stainless steel sheet obtained by a process according to any one of claims 31 to 35.

39. A process for fabrication of an exhaust gas purification catalyst-carrying honeycomb body, characterized by constructing a honeycomb body from an Fe-Cr-Al based stainless steel sheet comprising, by weight, Cr: 10-30% and Al: ≤6.5%, with the remainder consisting of Fe and unavoidable impurities, coating the surface of the steel sheet of said honeycomb body with Al powder, and then subjecting the steel sheet to diffusion heat treatment.

40. A process for fabrication of an exhaust gas purification catalyst-carrying honeycomb body according to claim 39, characterized in that said steel sheet further comprises, by weight, Si: 0.1-1.0% and Mn: ≤0.5%.

41. A process for fabrication of an exhaust gas purification catalyst-carrying honeycomb body according to claim 39 or 40, characterized in that said steel sheet further comprises, by weight, either or both Ti: 0.02-0.1% and Nb: 0.02-0.3%, as well as La: 0.01-0.1%, Ce: 0.01-0.1% and P: 0.01-0.05%.

42. A process for fabrication of an exhaust gas purification catalyst-carrying honeycomb body according

to any one of claims 39 to 41, characterized in that said coated Al powder comprises at least one from among Si, Ca, Sr, Y, Zr, Ba, La, Mg, Ce, Hf and Ta.